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ABSTRACT

The purpose of this study was to compare the effectiveness of four training procedures in changing translation behaviors of intern teachers and their pupils in secondary school social studies classes. The four training procedures or treatments (applied to four randomly assigned groups of intern teachers) were: an unstructured discussion of material that was to be taught later in social studies class; (2) oral instruction on how to teach the material; (3) videotaped demonstration of how to teach the material; and (4) a combination of the oral instruction and demonstration procedures. "Translation" was defined as "statements about the meanings of written words and combinations of written words in light of the context in which the words were used" and was classified and measured according to (1) pupil translation statements (oral and written) and (2) seven types of teacher behavior ("translation strategies"). Analysis of tapes of classroom presentations and discussions indicated significant differences (.01 level) between the four treatments: i.e., the unstructured discussion procedure was the least effective; and the demonstration plus presentation procedure was most effective (.05 level of significance). No differences were indicated between treatments on the written test scores. (Author/ES)

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FOR RESEARCH AND DEVELOPMENT
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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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Abstract

The purpose of the study was to determine whether different training procedures could change specific behaviors of intern teachers and their pupils in secondary school social studies classes. Four training procedures were compared in the study: (1) an unstructured discussion of material that was to be taught later in a social studies class; (2) oral instruction on how to teach the material; (3) a videotaped demonstration of how to teach the material; and (4) a combination of the oral instruction and demonstration procedures.

The instruction and demonstration training procedures emphasized the development of "translation" of a given piece of material through class discussion. Translation was defined as statements about the meanings of written words and combinations of written words in light of the context in which the words were used. Pupil translation statements, both written and expressed in discussion, were measured. Seven types of teacher behavior were measured: translation directions, elicitations, acceptances, rejections, probes, restatements, and periods of silence.

The experiment was conducted in the regular program of teacher training in secondary school social studies in the Stanford Secondary Teacher Education Program. Forty-three social studies intern teachers were randomly assigned to the four training groups. Within two days after training all of the intern teachers taught the same material in one of their secondary social studies classes. These discussions were tape-recorded and written translation tests were administered after the discussions.

Blind ratings of the tapes and tests averaged over 80 per cent agreement between two raters. The results indicated significant differences (.01 level) between treatments on the translation behaviors of the teachers and pupils in the discussions. The unstructured discussion procedure was the least effective; the presentation and demonstration procedures were equally effective; the demonstration plus presentation procedure was most effective (.05 level of significance between pairs of treatment means). No differences were indicated between treatments on the written test scores.

The results support the use of demonstrations combined with presentations in transmitting certain complex behaviors to teachers.

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COMPARISON OF TRAINING PROCEDURES FOR PROMOTING TEACHER AND LEARNER TRANSLATION BEHAVIOR

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In the fall of 1965, the Stanford Center for Research and Development in Teaching accepted a proposal for the development of videotapes demonstrating selected teacher and pupil behaviors relevant to secondary school social studies. Several tapes from the audio-visual library of the Stanford Secondary Teacher Education Program were selected for possible use in the Social Studies Curriculum and Instruction Course. Two of these tapes, entitled "Initiating Student Oral Reports," and "Discussing a Complex Contemporary Problem," were shown in the course on an exploratory basis. Positive feedback, in the form of a rating guide, open-ended written evaluations, and face-to-face informal comments was obtained from the social studies interns.

An extensive review of film catalogues, as well as inquiries to publishers and universities, revealed a number of films that were relevant to secondary school social studies. The films dealt with discussion methods, general teaching methods, problem-solving methods, small group instruction, role-playing, discipline, and the operation and uses of several audio-visual devices. Dr. Edwin Fenton, at Carnegie Institute of Technology, had just developed five half-hour films portraying a teacher

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[1]The research described here was carried out while the author was a Research Assistant at the Stanford Center for Research and Development in Teaching.

and his pupils exploring five questions during the first five days of a world history class. The questions raised were: How does the historian classify information, prove a hypothesis, decide what is fact, ask questions, and deal with "mind set"?

Although no relevant videotapes were found ready for distribution, a few projects were under way. Indiana University was producing videotapes designed to display desired teacher and pupil behavior in secondary school classrooms. The University of Colorado was developing videotapes designed to show certain "good" and "bad" practices in secondary school social studies. In addition, several teacher training institutions were beginning to use videotaping equipment and were simultaneously developing unplanned collections of videotapes.

From the viewpoint of the present study, the problem with most of the existing films and videotapes was their failure to focus upon desired cognitive objectives, displayed in terms of pupil behavior. Only in the Fenton films was the general focus upon a type of pupil behavior denoted as "inquiry." All of the other films and videotapes seemed inadequate for use in the kind of training which emphasizes the systematic development of specified cognitive behaviors in the pupil.

Statement of the Problem and Overview of the Study

Two broad questions evolved from these initial explorations by the Stanford Secondary School Social Studies Videotaping Project: (a) Could videotapes be produced which displayed both selected pupil cognitive behavior desired in secondary school social studies and also developmentally related teacher behavior? (b) If produced and used for training purposes, could the videotapes be demonstrated to influence the teaching behavior of intern teachers?

In presenting partial answers to these two major questions, this study has attempted to resolve three related difficulties: conceptual, developmental, and experimental problems.

Conceptual Problem

The conceptual problem was to identify the different types of teacher and pupil behavior so that classroom behavior could be quantified. This was necessary in order to select special teacher and pupil actions for display on videotapes, as well as to determine the effects of the videotapes on the intern teachers' classroom behavior.

Two types of pupil behavior were identified and denoted as pupil oral translation, and pupil written translation. These translation behaviors were defined as statements by pupils about the meanings of written words, and combinations of written words, in light of the context in which the words were used. Pupil oral translation consisted of statements made in classroom discussion; pupil written translation consisted of written answers on a test designed for the study. An example of pupil translation behavior would be: "It seems to me that by 'nightmare world,' Mr. Wechsler is trying to say that the committee is twisting things around."

Seven types of behavior by the teacher, denoted as teacher translation tactics, were identified and assumed to be useful in achieving pupil oral translation. These behaviors were (a) translation directions, (b) translation elicitations, (c) translation acceptances, (d) translation rejections, (e) translation probes, (f) translation restatements, and (g) translation silences. Combinations of these translation tactics were denoted as translation strategies.

Developmental Problem

The developmental problem of this study was to create the materials required by an experimental analysis. These materials included the videotapes which displayed the pupil oral translation and the teacher translation tactics; the guide used by raters to score the teacher and pupil behaviors; the standardized experimental lessons for classroom use; and a written test of the ability to translate.

Experimental Problem

The experimental problem of this study was to test the effect of demonstration videotapes, which displayed the teacher translation tactics used by teachers to achieve pupil oral translation, on the ability of intern teachers to use the translation tactics to achieve pupil oral and written translation.

Forty-three intern teachers were randomly assigned to four different training groups. All of the interns received the same classroom material for use in their experimental lessons, which were to be conducted on one of the two days following their training. One training group participated in an unstructured discussion of the material they were to teach; a second group was orally instructed in the use of teacher translation tactics; a third group viewed two videotapes demonstrating the use of the teacher translation tactics; the fourth group received oral instruction in the use of teacher translation tactics and also viewed the two demonstration videotapes.

During one of the two days following their training, the interns taught an experimental lesson in one of the secondary school social studies classes which they normally taught. These experimental lessons were recorded on audiotape, and toward the end of the lessons the tests of writ-

ten translation ability were administered. The classroom recordings provided the data for measuring pupil oral translation and the teacher translation tactics, while the written tests provided a measure of pupil written translation ability.

Hypotheses Tested

It was hypothesized that the four training procedures would influence translation behaviors, i.e., pupil oral translation, pupil written translation, and the teacher translation tactics, in the following ways:

1. The oral instruction procedure would produce significantly more translation behavior than would the unstructured discussion procedure.

2. The demonstration procedure would produce significantly more translation behavior than would the oral instruction procedure.

3. A combination of the oral instruction and demonstration procedures would produce significantly more translation behavior than would either procedure alone.

Procedures

The procedures of this study were grouped into three stages -- a conceptual stage, a developmental stage, and an experimental stage -- which represented the three major problems under investigation.

Conceptual Stage

Upon first consideration, classroom discourse appears to fall into two simple categories: teacher talk, and pupil talk. However, further reflection on oral behavior in the classroom can lead to many schemes for analyzing and classifying such behavior. The purpose of this study was to identify a relatively simple class of pupil behavior which represented desirable educational outcomes in secondary school social studies and to identify a few types of teacher behavior which were relevant to attaining the desired pupil behavior. Identifying an educationally desirable

class of pupil behaviors led to an investigation of different types of cognitive behavior evident in teacher-pupil verbal interaction. Identifying relevant teacher behavior led to an investigation of the different verbalizations used by teachers in directing pupils toward intended goals.

Cognitive behavior. The classifications of cognitive behavior made in this study are related to the systems of Bloom, et al. (1956) and Bellack, et al. (1963). The class of cognitive behavior of primary concern was derived largely from the Bloom system and was denoted as translation.

Translation is defined as meaning,

> ...that an individual can put a communication into other language, into other terms, or into another form of communication. It will usually involve the giving of meaning to the various parts of a communication, taken in isolation, although such meanings may in part be determined by the context in which the ideas appear (Bloom, et al., 1956, p. 89).

During the early phases of the study, it appeared that this definition of translation would be adequate. It provided the basis for the development of the written translation test as well as the demonstration videotapes. However, the training of raters to analyze and classify the audiotapes of classroom discourse revealed that "translation" needed to be delineated more precisely. Translation, therefore, was limited to refer only to statements about the meanings of written words, and combinations of written words, as they are used in a particular context. Thus, translation behavior is empirical behavior, in that it consists of statements about the meanings of words used in a communication, the verification of which depends upon internal evidence drawn from the context.

Pupil oral translation. Within the context of classroom discourse, where the teacher is trying to teach pupils to translate parts of some

written material, the translation behaviors are the pupil's responses to certain behavior by the teacher. These responses are denoted as pupil oral translation behaviors.

Pupil oral translation behaviors were categorized as being of two types:

1. Initial Oral Translation Responses: These represent the first translation responses given by the student to the various parts of a communication; e.g., "It seems to me that by 'nightmare world' Mr. Wechsler is trying to say that the committee is twisting things around."

2. Secondary Oral Translation Responses: These represent translation responses which follow the first translation response to a given part of a communication. Secondary oral translation responses often were expansions or improvements upon an initial oral translation response; e.g., "By that he means that the things he says are being twisted around by McCarthy and used against him."

Teacher translation tactics and strategies. The following types of teacher behavior were assumed to be related to the development of pupil oral translation. Each of these teacher translation tactics was assumed to serve different developmental functions.

1. Translation Directions: These include teacher statements which direct pupils to the task of oral translation; e.g., "Let's see if we can figure out the meanings of some of the things being said in this article."

2. Translation Elicitations: These include teacher questions intended to evoke initial oral translation responses from pupils; e.g., "What does Mr. Wechsler mean, here on page seven, when he says it's a 'nightmare world'?"

3. Translation Acceptances: These include teacher statements such as, "Good," or, "That's right," which indicate that the teacher is either partially or totally accepting a pupil oral translation response.

4. Translation Rejections: These include teacher statements such as, "No," or, "I don't think so," which indicate that the teacher is either partially or totally rejecting a pupil oral translation response. Translation acceptances and rejections may be used together in discriminating among the parts of a pupil response.

5. Translation Probes: These include teacher questions intended to evoke improved or expanded oral translation responses from either an initially responding pupil or from another pupil. These probing questions will often ask the pupil to clarify what he means or to attempt to be more complete in his translation; e.g., "Can you explain that further?"

6. Translation Hints: These include teacher statements which give partial translation or directions intended to assist a pupil in achieving an oral translation response; e.g., "Might he be referring to Senator McCarthy's tactics here?"

7. Translation Restatements: These include teacher restatements of the oral translation responses of pupils, or a summarization of several pupil oral translation responses. These statements may consist of some clarifications; however, statements which represent translations by the teacher are not considered restatements.

8. Translation Silences: Although not an oral behavior, this category is included because it is related to the development of translation. It is an interval which lacks oral behavior and which is intended to give pupils time to explore the material or to think about the question in order that they may make an oral translation response.

Combinations of these teacher translation tactics, employed for the purpose of achieving pupil oral translation behavior, were denoted as translation strategies.

The eight teacher translation tactics and the use of these tactics as strategies for teaching pupil oral translation were presented to intern teachers in three types of training procedures. However, during the training of raters for analysis of the audiotapes, it was discovered that translation hints were difficult to distinguish from translation probes. Translation hints, therefore, were reclassified as a subcategory of translation probes.

Developmental Stage

A written communication was developed to serve as a basis for the classroom discussions, and a written test was designed to measure the pupils' ability to translate parts of the written communication. Two dem-

onstration videotapes were assembled, each displaying the teacher translation tactics and pupil oral translation. Finally, an interaction-analysis guide was developed for scoring and classifying classroom verbal behavior.

The written communication. The demonstration videotapes and the discussions conducted by the intern teachers were all based upon the written material entitled, "A Senate Subcommittee Investigation: The Testimony of James A. Wechsler." This communication was synthesized from sixty-four pages of subcommittee hearings concerning the examination of James A. Wechsler by Senator Joseph McCarthy (see U. S. Senate, 1953).

The material was pretested in one school by three teachers and 150 pupils representing a wide range of ability and three grade levels -- tenth, eleventh, and twelfth. The material was judged to be extremely interesting by the teachers and by most of the pupils. Although it was judged easy to read by most of the pupils, there was wide disagreement on this point. Some parts, e.g., the selection from the Daily Worker, were commonly agreed upon as being more difficult to understand than others. It was agreed upon by all teachers that the communication tended to raise questions not included in translation objectives, e.g., Who was right and who was wrong? Was Wechsler really a Communist? Is this kind of interrogation democratic? The results of the pretest indicated that the material would be appropriate for use in the study.

The written translation test. The written test was designed to measure the pupils' ability to translate: [illegible] short answers to questions about the meanings of words and combinations of words contained in the written communication.

The test was pretested on 60 tenth, eleventh, and twelfth-grade pupils. Those items which were confusing, or which discriminated in a reverse order, were eliminated. A revised test, containing 12 questions, was then pretested on 80 twelfth-grade pupils. The items ranged in difficulty from 19 to 93 percent missed. The mean number of errors was 5.76, with a standard deviation of 2.61. In scoring these pretests, two raters were in agreement on 91.5 percent of the items as to whether the answers were correct or incorrect. The test's reliability was computed to be .71 by the split-half method (Downie, 1958).

After scoring the pretests, a "translation-test scoring guide" was written for use in scoring the written tests to be administered to pupils following the experimental discussions.

Videotaped demonstrations. Two videotapes, displaying the teacher translation tactics and pupil oral translation responses, were developed for use in two of the experimental training treatments of the study. Two public school teachers served as demonstration teachers after each had become thoroughly acquainted with the written communication and the general frame of reference of the study. They then used the translation tactics to achieve pupil oral translation in two of their regular twelfth-grade classes. Those four lessons were videotaped and from them two portions, one eight minutes long and one six minutes long, were selected to serve as demonstration tapes for the experimental study. The portions selected had at least one example of each teacher's translation tactics and several examples of initial and secondary pupil oral translation responses.

The interaction-analysis guide. In order that classroom discussion could be categorized, an interaction-analysis guide was designed as a

general classification system applicable to classroom discussion in secondary school social studies. The guide specifically accounted for the behavior of primary interest in the study, i.e., the seven teacher translation tactics, and the two types of pupil oral translation: it required the raters to determine the "speaker," the "pedagogical move," and the "class of cognitive behaviors" which were represented in classroom oral behavior.

The "speaker" was either the teacher or a pupil, or, in some situations, might refer to an audio device or a person not normally in the classroom.

"Pedagogical moves" referred to the function of oral behavior. The functions identified in the guide were (a) task directions, (b) elicitation, (c) probe, (d) silence, (e) initial response, (f) secondary response, (g) acceptance, (h) rejection, (i) restatement, (j) statement, and (k) procedural. To exhaust all classifications of classroom oral behavior along this dimension, three additional categories, which do not represent clear pedagogical functions, were included: (m) inaudible, (n) confusion, (o) not clear.

The following six classes of cognitive behavior were defined in the guide: (a) translating, (b) defining, (c) fact stating, (d) internal explaining, (e) external explaining, (f) evaluating. To make exhaustive the classification of classroom cognitive behavior, four additional categories were included: (g) incorrect, (h) in doubt, (i) not clear, and (j) no cognitive class evident.

The cognitive dimension of classroom verbal behavior included both overt and covert elements. For example, when a teacher asks, "What are the names of the people in this hearing you just read about?", it can be

inferred that the teacher is requesting fact-stating behavior: the cognitive dimension of the teacher's question is considered to be fact stating.

The interaction analysis guide provided detailed descriptions of the dimensions of classroom oral behavior, with examples drawn from the written communication used in the study. The guide also presented coding rules designed to increase the reliability of making several difficult distinctions. Finally, the guide explained the general procedure for scoring the audiotapes.

Experimental Stage

Subjects. Of the original population of 46 social studies intern teachers enrolled in the Stanford Secondary Teacher Education Program, seven were unable for various technical reasons to complete satisfactorily all requirements of the present study. Thus, audiotaped data were gathered from 39 interns, while complete written test data were gathered from only 34. Treatment group one contained 11 interns; treatment group two, ten interns (seven with complete data); treatment group three, 10 interns (nine with complete data); and treatment group four, eight interns (seven with complete data). Data from the 39 interns were used to compare groups. Descriptions of the relationships between the written test scores and other classroom behaviors were based on the complete written and audiotape data obtained from the 34 interns' classrooms.

Experimental design. Four experimental treatments were applied to four independent groups using a posttest-only design (Campbell & Stanley, 1963).

A pretest was not used in this study because it seemed highly probable that a pretest closely related to the specific content of the study would have produced main effects upon the criterion measures as well as

interactions with the experimental treatments. More extensive designs to evaluate these effects were not feasible. Campbell and Stanley (1963, p. 196) suggest, however, that when no pretest is used, ". . . if appropriate antecedent variates are available, they should certainly be used for blocking or leveling, or as covariates." Since the relatively small number of subjects in the experiment prohibited blocking and leveling procedures, information was collected on four antecedent variables and two concomitant variables for possible use as covariates. These variables included grade level, class ability, interns' teaching ability, class size, time allotted for experimental discussions, and time allowed for taking the written tests. None of the antecedent or concomitant variables were significantly correlated with pupil written translation or teacher translation tactics. Means and standard deviations for the three variables -- grade level, pupil ability, time allowed for written test -- which were significantly correlated with pupil written translation are given in Table 1. These variables were used in supplemental covariance analyses, but these analyses provided no additional information and will not be reported here.

TABLE 1

Treatment Means and Standard Deviations
of Grade Level, Pupil Ability, and Time Given for Test

Treatment	Grade Level		Pupil Ability		Time Given for Test	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
(1) Unstructured Discussion	3.09	1.22	2.27	0.65	12.91	3.53
(2) Oral Instruction	3.43	1.14	2.00	0.57	13.86	2.03
(3) Demonstration	2.67	.87	2.33	0.87	12.22	3.56
(4) Oral Instruction plus Demonstration	3.29	.98	2.57	0.54	14.43	3.39

Experimental treatments. The author and two Stanford social studies supervisors served as instructors for the experimental treatments. The experimenter gave the oral presentations of treatments #2 and #4. The videotaped demonstrations of treatments #3 and #4 were introduced and cued by a second instructor. The discussion of treatment #1 was conducted by a third instructor.

Treatment one was an unstructured 30-minute discussion of the written communication carried on by the instructor and the interns. No further instructions were given: neither pupil translation behaviors nor teacher translation tactics were mentioned. The discussion centered upon an explanation of certain parts of the material, of events related to the McCarthy hearings, and principally, upon an evaluation of issues related to the hearings.

Treatment two was a 16-minute oral description in which translation was presented as the desired pupil behavior. Systematic use of the eight teacher translation tactics was suggested as an appropriate way to achieve pupil oral translation responses. Examples of each of the tactics, based upon the written communication, were given.

Treatment three consisted of two videotaped demonstrations of teacher translation tactics and pupil oral translation responses.

The instructor introduced the tapes by explaining that the interns should attempt to conduct a discussion like those presented on the videotapes, with particular regard to achieving the same type of pupil response.

Treatment four was a combination of the oral description and two videotaped demonstrations which were presented singularly as treatments two and three.

Rating the classroom discussions. Two people were trained to rate audiotapes of classroom discussion. Practice rating was continued until at least 90 percent interrater agreement was achieved on all of the translation categories contained in the guide. Following their training, the raters began scoring the 39 audiotapes of classroom discussions. The tapes were randomly assigned so that both raters had the same number of tapes from each treatment group (except for the 11 tapes in treatment one). Coefficients of rater agreement were obtained by having both raters score the same eight tapes prior to randomization of the remaining 31. Also, Scott's reliability coefficients were computed across selected categories. This coefficient is used by Flanders (1960) and Schroeder (1964). Flanders (1960, p. 10) describes Scott's coefficient "as the amount that two observers exceeded chance agreement divided by the amount that perfect agreement exceeds chance." These coefficients of rater agreement on pedagogical moves, cognitive classes, and translation behaviors are presented in Tables 2, 3, and 4.

TABLE 2

Rater Agreement: Pedagogical Moves

Pedagogical Moves	Number of Agreements	Number of Disagreements	Coefficient of Rater Agreement
Directions	6	2	.75
Elicitations	115	63	.65
Probes	138	89	.61
Silences	20	6	.77
Acceptances	194	41	.83
Rejections	3	4	.43
Restatements	158	33	.79
Statements	3	17	.15
Responses	348	44	.89
Procedural	10	9	.53
All moves	995	237	.81

Scott's reliability coefficient computed across the pedagogical move categories is .82.

TABLE 3

Rater Agreement: Cognitive Classes

Process Categories	Number of Agreements	Number Disagreements	Coefficient of Rater Agreement
Defining	0	0	---
Translating	118	26	.82
Translating: incorrect	0	0	---
Translating: in doubt	1	0	1.00
Fact Stating	51	40	.56
Explaining: internal	598	85	.88
Explaining: external	53	24	.69
Evaluating	31	44	.41
Not Clear	2	7	.22
All moves	854	113	.88

Scott's reliability coefficient computed across the process categories is .89.

Scoring the written translation tests. A scoring guide, developed during the analysis of the pretests, was used to score the 34 sets of written translation tests administered in the study. These 34 classroom sets (858 individual tests) were randomized by permutations of four (one from each experimental treatment) into two groups, one group being assigned to each rater, who scored independently and without knowledge of experimental treatments.

To establish a measure of interrater agreement, five tests were randomly selected from each classroom set of tests, and these 170 tests (20 percent of the total) were scored by both raters. In scoring the 2,040 responses on these tests the raters were in agreement 95.4 percent of

the time. For the entire test, reliability estimate of .82 was obtained by the split-half method (Downie, 1958). This estimate was made from the 20-percent sample of the tests scored by both raters.

TABLE 4

Rater Agreement: Translation Behaviors

Translation Categories	Number of Agreements	Number of Disagreements	Coefficient of Rater Agreement
Teacher translation directions*	2	1	.67
elicitations*	17	7	.71
probings*	18	15	.55
silences*	5	2	.71
acceptances*	23	12	.66
rejections*	0	0	---
restatements*	13	5	.72
Teacher translation tactics: total	82	34	.71
Teacher translation statements	1	1	.50
Pupil translation: incorrect	0	0	---
in doubt	1	1	.50
Pupil oral translation*	40	11	.78

*Scott's reliability coefficient computed across these categories is .93.

Results

It was hypothesized that the four training procedures would differentially and predictably influence the frequencies of pupil oral transla-

tion, teacher translation tactics, and pupil written translation. The means and standard deviations of these dependent variables for each of the experimental treatments are reported in Table 5.

An analysis of variance for each of the three dependent variables (Table VI) indicated that the differences between treatments on pupil oral translation and teacher translation tactics were statistically significant at the .01 level. The differences between means on the pupil written translation test was not significantly different from chance variation. Thus, the major experimental hypothesis was partially supported by the results on two of the three dependent variables. It had also been hypothesized that the four training procedures would vary in the following ways:

1. The oral instruction would produce significantly more translation behavior than would the unstructured discussion.

2. The demonstration would produce significantly more translation behavior than would the oral instruction.

3. A combination of oral instruction and demonstration would produce significantly more translation behavior than would either alone.

To test these hypotheses, comparisons were made between all pairs of treatments for the mean frequencies of pupil oral translation and teacher translation tactics by means of the Newman-Keuls test (Winer, 1962). These comparisons revealed that the effects of treatment four were significantly different ($p < .05$) from the other three treatment groups on both pupil oral translation and teacher translation tactics.

TABLE 5

Means and Standard Deviations, Within Experimental Treatments, for the Frequency of Occurrence of Pupil Oral Translation, Teacher Translation Tactics, and Pupil Written Translation

Experimental Treatment	Sample Size	Oral Translation		Translation Tactics		Written Translation	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
(1) Unstructured Discussion	11	0.27	0.90	0.91	2.70	6.93	1.94
(2) Oral Instruction	10	5.70	5.89	12.90	11.81	6.45	1.71
(3) Demonstration	10	5.20	4.13	11.20	8.50	6.92	2.15
(4) Oral Instruction Plus Demonstration	8	10.88	7.47	26.38	20.33	5.54	2.19

TABLE VI

Analysis of Variance of the Three Dependent Variables

Dependent Variables	Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio	p
Pupil Oral Translation	Treatments	526.83	3	175.61	7.11	.01
	Within Groups	864.76	35	24.71		
	Total	1391.59	38			
Teacher Translation Tactics	Treatments	3019.79	3	1006.60	7.23	.01
	Within Groups	4871.28	35	139.18		
	Total	7891.08	38			
Pupil Written Translation	Treatments	9.96	3	3.32		NS
	Within Groups	120.68	30	4.03		
	Total	130.64	33			

However, there were no significant differences between any other pair of treatments, nor were there any significant treatment differences on the written translation test scores.

Because it seemed unlikely that the assumptions of normality of distribution and homogeneity of variance had been met, the data were analyzed further using the nonparametric Kruskal-Wallis test. This procedure revealed that treatment one produced significantly fewer ($p < .05$) pupil translation behaviors and teacher translation tactics than did treatments two, three, or four. No other significant differences were found.

Discussion

The statistical analyses of the results of the four training procedures indicated that the unstructured discussion procedure (treatment one) was significantly inferior to the other three training procedures. The more stringent parametric tests indicated that the differences between

treatment four and treatments two and three were significant at the .05 level; however, these results might be questioned due to assumption violations for the parametric test. Nevertheless, the observed differences between treatment four and treatments two and three may have practical utility.

The data did not show differences between treatments on the measure of pupil written translation -- although there was a -0.30 correlation (nonsignificant) between pupil written translation and teacher translation tactics. (The correlations were negative because the test scores were expressed in errors.) The absence of treatment differences was surprising, since little time was devoted to translation by the unstructured discussion group (treatment one), whereas 20 percent of the teacher-pupil behaviors in the oral instruction plus demonstration group (treatment four) consisted of translation.

The findings question the efficiency of translation-oriented discussions as a means of developing pupil written translation; they suggest that teacher translation tactics may not fulfill the function of developing pupil oral translation as much as they serve to assess pupils' abilities to translate material that has been read.

Another possibility is that discussions which are oriented toward cognitive behavior other than translation may demand varying degrees of unspoken translation. For example, if a teacher asks, "Is McCarthy being fair in making this accusation?", the pupil may find it necessary to translate the accusation before making a judgment of fairness.

The results, while indicating that there were no treatment differences with respect to pupil written translation, raise, but do not answer, a complex question: To what extent does the ability to translate result

from reading,[1] or from different types of discussions?

Several aspects of the results and training procedures regarding the treatment differences on pupil oral translation and teacher translation tactics need further exploration. Translation was chosen as a behavior whose frequency, without the explicit direction of teachers or pupils, could be expected to be low in classroom discussions. However, it was not considered to be a contrived or irrelevant task. The occurrence (twice) of translation behavior in the unstructured discussion group indicated that translation does occur without translation-oriented training. However, the data do not truly provide a baseline indication of the frequency of translation behavior in the "average" social studies classroom or under different conditions. It appears that both the material used for the discussions of this study and the unstructured discussion treatment, by encouraging evaluative-type behaviors, tended to discourage translation behavior.

There is a major problem regarding the three translation-oriented training procedures: the most effective procedure resulted in discussions composed, on the average, of only 20 percent translation behaviors, and the other two procedures produced only about 12 percent. The inefficiency of the training procedures can be attributed primarily to a lack of clarity concerning the concept of translation. The main characteristic of translation that appeared to result from the oral instruction was that a pupil had put a communication into his own words. The more precise definition of translation, particularly the characteristic, "in light of the context," was made during the training of raters -- after

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[1]Several studies suggest that simple translation instructions given prior to the reading of material would result in gains in pupil written translation (Rothkopf, 1965, pp. 208-215; Lumsdaine, 1963, pp. 640-643; Fischer, 1958).

the experiment had been conducted.

The three experimental treatments of this study used relatively weak training procedures. It appears that if a clearer definition of translation had been used in the training procedures, and if it had been supported by numerous examples related to the material to be used in the classroom, then the efficiency of the training procedures would have been greatly improved.

The oral instruction plus demonstration procedure was about twice as long as either of the other translation training procedures. However, if the instruction time for this procedure had been the same as for the other two procedures, both the oral instruction and the demonstration components of the procedure would have had to have been altered. Thus, training duration and training procedures are confounded for treatment four.

Conclusions and Implications

The results of the experiment, although not conclusive, suggested that the behavior of intern teachers, relative to the attainment of a specified class of pupil behavior, could be affected by relatively short presentation-type training procedures. The evidence indicated that either oral instruction or demonstration presentations alone could change the behavior of intern teachers, but that a combination of the two procedures may have resulted in more of the intended behavior than either procedure alone. It is important to note that these behavior changes can be brought about without employing overt practice or feedback as part of the training.

Several factors limit the generalizability of these findings, and at the same time suggest possibilities for future research. The rela-

tively low proportions of translation behavior in the three groups receiving translation training suggest that these procedures were far from optimal. Further research must determine the combination of factors which lead to optimum efficiency of oral (and written) instruction, demonstration, and oral instruction plus demonstration procedures. The definition of translation and the unconfounding of the instruction-time variable are two crucial factors which await additional investigation.

The effects of different training procedures on the achievement of pupil cognitive behavior other than translation and in the transmission of specified teacher skills and strategies are also areas of potentially fruitful explorations. The absence of observed treatment differences on pupil written translation, contrasted with the significant correlation between pupil oral translation and pupil written translation, suggests the need for further research in this area.

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